

of a semiconductor die, comprising:

applying a first layer of material to said surface of said semiconductor die;

applying a second layer of material as a mask to a portion of a surface of said first layer of material;

applying an encapsulant material to a remaining portion of said surface of said semiconductor die;

curing said encapsulant material; and

peeling said first layer of material from said surface of said semiconductor die to remove said misplaced encapsulant material.

29. The method of claim 28, wherein said first layer of material and said second layer of material include a silicon gel material.

30. The method of claim 28, wherein said first layer of material and said second layer of material include an elastomeric material.

31. The method of claim 28, wherein said second layer of material includes a material selected from the group of natural rubber, synthetic rubber, and room temperature cured silicon rubber.



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[54] ATTACHMENT METHOD FOR HEAT SINKS AND DEVICES INVOLVING REMOVAL OF MISPLACED ENCAPSULANT

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[53] Field of Search 438/122, 127, 438/753, 118

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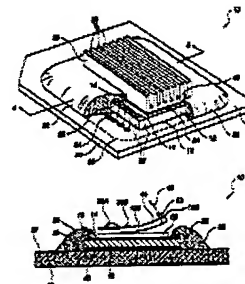
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[57] ABSTRACT

A process for forming a thermally enhanced chip on board semiconductor device with a heat sink is described. In one aspect, a thermally conducting insulative material of filled gel elastomeric material, or a silicone elastomeric material or other elastomeric material is applied to the surface to which the heat sink is to be bonded. A protective elastomeric layer is then applied to the insulative material (or heat sink). During subsequent glob top application and curing steps, it is conventionally difficult to remove unwanted glob top material, that which may have been unintentionally misapplied to the die surface. In the practice of the invention, the misplaced, encapsulated (glob top) material adheres to the upper surface of the protective layer. The protective layer of material is then removed by peeling to also remove the misplaced glob top material prior to subsequent bonding of the heat sink to the die.

90 Claims, 6 Drawing Sheets



film together via said adhesive layer, of coating at least a joint region between said semiconductor chip and said carrier film at a lateral side of a bonded unit of said semiconductor chip and said carrier film with a fluororesin coating material.

19. A method as claimed in claim 12, further including the step, after the step of bonding said semiconductor chip and said carrier film together via said adhesive layer, of coating at least a joint region between said semiconductor chip and said carrier film at a lateral side of a bonded unit of said semiconductor chip and said carrier film with a fluororesin coating material.



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Kata et al.

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(54) PROCESS FOR ADHESIVELY BONDING A SEMICONDUCTOR CHIP TO A CARRIER FILM

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(57) ABSTRACT

In a method of manufacturing a semiconductor device comprising a semiconductor chip and a carrier film which includes an insulating film and wiring patterns formed on one of main surfaces of the insulating film, an adhesive layer is formed on a surface of a semiconductor wafer having a number of integrated circuits. Each of the integrated circuits has electrode pads for external connections on the foregoing surface of the semiconductor wafer. Subsequently, openings are formed in regions of the adhesive layer corresponding to the electrode pads, and then, the semiconductor wafer is cut per integrated circuit so as to divide the semiconductor chips. Thereafter, the electrode pads of the semiconductor chip and the wiring patterns of the carrier film are connected to each other through the corresponding openings of the adhesive layer, respectively. Then, the semiconductor chip and the carrier film are bonded together via the adhesive layer integrated therebetween. It may be arranged that the adhesive layer is formed on the carrier film rather than on the semiconductor chip.

28 Claims, 14 Drawing Sheets

